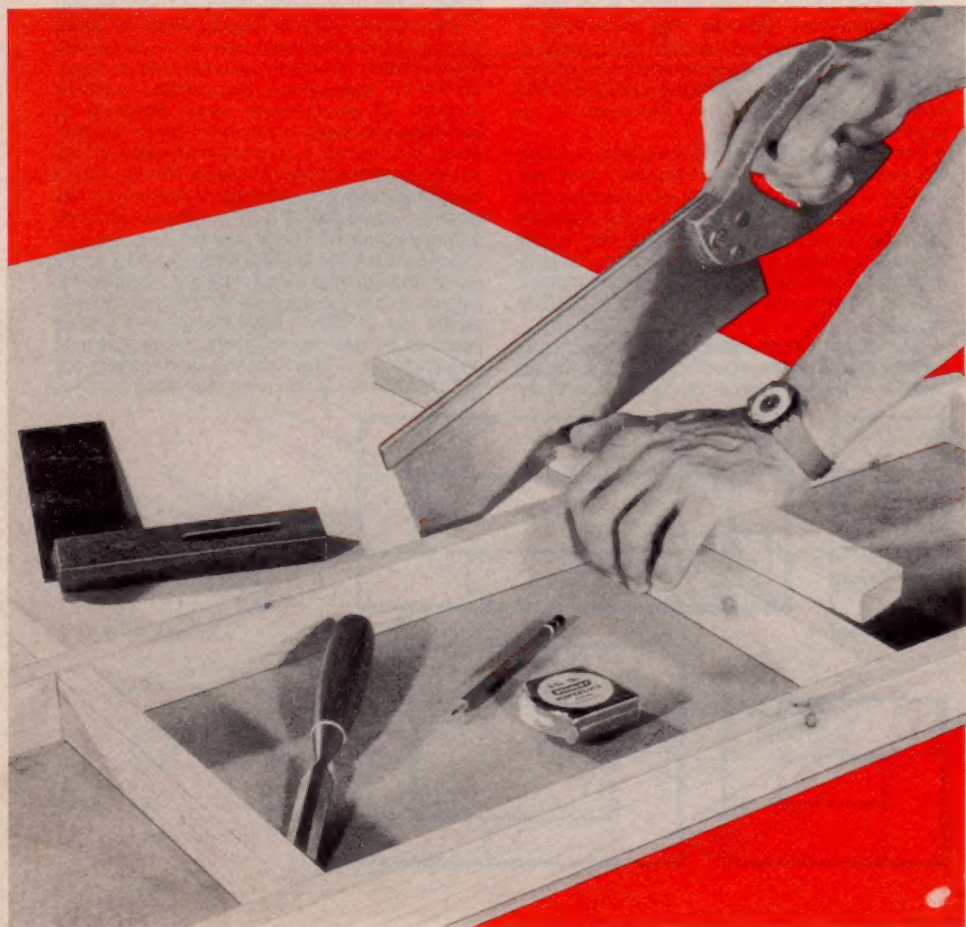


BUILDING BASEBOARDS

FOR THE AVERAGE ENTHUSIAST

20p

RAILWAY MODELLER 'SHOWS YOU HOW' SERIES



BUILDING BASEBOARDS

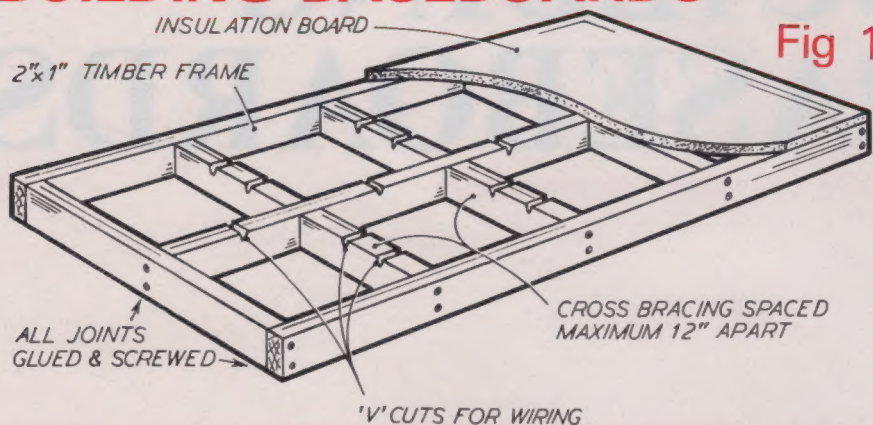


Fig 1

A model railway is only as good as its baseboard. However carefully the trackwork is designed and laid, the scenery and buildings constructed and the wiring and control systems installed, a warped and sagging baseboard will spell *trouble* from the moment it is commissioned.

For most model railway enthusiasts, building the baseboard is a bore. Naturally, they are itching to get on with the job of modelling, but nothing can be done — not even detailed planning — until the baseboards are at an advanced stage. So, for most of us, it is a question of getting the job done in the quickest time commensurate with a strong and durable result.

Now there are as many ways of making a baseboard as there are of building a model railway. We have seen a beautiful job, entirely

constructed of plywood, glued and pinned into a monocoque 'cellular' construction of great strength. The result was superb, but its builder had a passion for woodwork, and was an engineer 'in his spare time'. Conversely, a simple modern plywood-faced door, covered in Sundeala and easily obtainable new or second-hand, has formed a satisfactory baseboard for a good number of junior layouts, though wiring and point motors must be inconveniently on the surface — and 6'6" x 2'6" can be a mighty inconvenient size to carry around.

So it is that this booklet does not attempt to cover every known way of building a baseboard. Rather, it sets out the tried-and-tested methods which we at PECO have found, over many years, to be ideal for beginners and experienced modellers alike. Most of the baseboards in our PECORAMA exhibition were built along the lines



Fig 2

A 4' x 2' baseboard is easily built and handled. This diagram shows just some of the possibilities when such units are used in multiple to form layouts of all sizes and configurations.

described here, and have stood the test of time in virtual daily operation.

DESIGN

With the possible exception of the aforementioned door panel, a baseboard *must* be braced with a strong framework. In fact, the frame should provide the baseboard with *all* its strength and rigidity with the top surface simply acting as the 'ground' upon which the model railway is built. The frame also provides a clearance under the board, in which wiring, point motors etc. can be safely tucked away. The frame should be 'notched' along the top edge, before the top is fixed, to take the wiring.

Fig. 1 shows a strong, simple and highly recommended baseboard. The frame is of 2" x 1" (50mm x 25mm) prepared timber. In addition to the 'perimeter' frame, there are cross braces at 12" intervals. The top surface is of 3/8" thick (9mm) Sundeala insulation board. The 4' x 2' board shown in the drawing is, in fact, a very good size for a baseboard 'module' which can be used in multiple to form layouts of almost any regular size and shape — Fig. 2 gives some of the possibilities. The classic 6' x 4' baseboard, so easily constructed from one sheet of material, is not such a good idea when it needs to be moved about. It is also too much of a stretch for the operator unless a 'well' is cut in the centre of the board. Thus the 4' x 2' board, used in multiple, is easy to lift, store and transport,

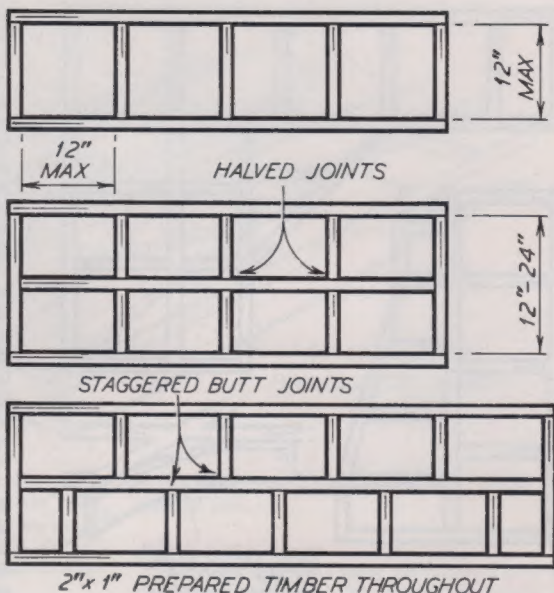


Fig 3

and makes economical use of standard 4' wide sheets. Joining boards together need not be a problem — see later in this booklet.

FRAMEWORK

Although hardwood, in a perfect world, would make an excellent main frame for the baseboard, considerations of cost will almost

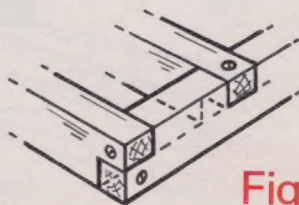
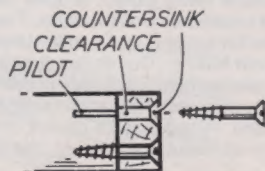
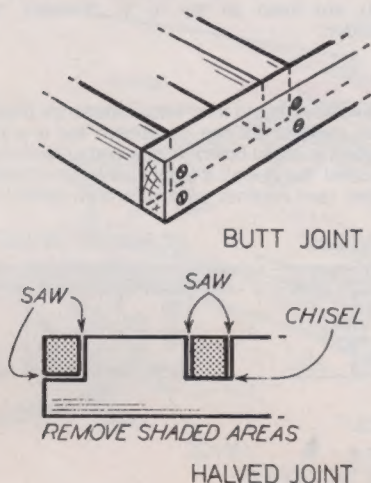


Fig 4

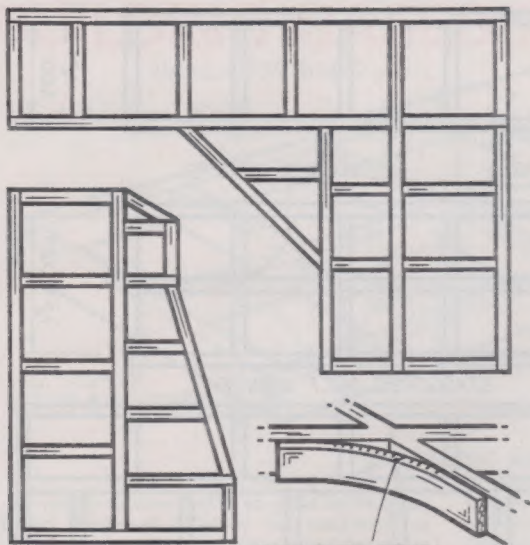


Fig 5

SAW CUTS DOWN
INSIDE EDGE OF
2"x1/2" TIMBER

certainly dictate that softwood be used. This will be perfectly satisfactory, so long as the wood chosen is:

Not smaller than 2" x 1" (50mm x 25mm) nominal, or 3" x 1" if extra strength is required and price is not a consideration. Properly seasoned and not likely to warp. Absolutely straight, and free from large knots or cracks.

Free from rot or woodworm!

Many beginners, with little or no experience of carpentry, worry about joints. This is unnecessary, as the simple butt joint, glued with white PVA adhesive and screwed through both the sections being joined, is quite satisfactory for most baseboard construction. The cut must of course be square, and a mitre block is a tool well worth having. Our drawing of a butt joint (Fig. 4) shows how each screw should have a pilot hole, clearance hole and countersink drilled beforehand. Wood screws cannot cut a hole — if you try to make them do so, the timber will

almost certainly split along the grain. Combination bits can be bought for drilling pilot, clearance and countersink in one operation, if you are feeling very professional. Ideal size screw for most baseboard construction is 2" No. 8 countersunk. Best purchase a gross — you will be astonished at how many you use! Modern woodworking glues are immensely strong, so a combination glued/screwed butt joint gives a 'belt and braces' security if well made.

Fig. 4 also gives details of simple halved joints, which are made with a sharp saw and chisel as indicated. As the frame plans (Fig. 3) show, halved joints come into their own when a baseboard is over 12" wide, although they can be avoided by simply staggering the bracing and using butt joints instead (see lower sketch, Fig. 3).

It is obviously very important that the top surface of the frame is absolutely flat before the insulation board top is glued and pinned down. Don't think that the board will straighten out the frame — it won't!

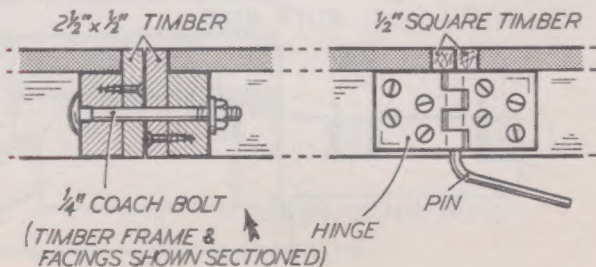
ODD SHAPES

Having recommended that baseboards be constructed from small and easily-handled rectangular 'modules' we have to admit that peculiar shapes are sometimes required in layout construction. Even so, most shapes can be based on rectangles, with suitable 'fillers' and 'outrigger' sections. Fig. 5 shows what we mean, and also illustrates a curved edge, from 2" x 1 1/2" timber, partially cut through at regular intervals on the inside. This curve would be cosmetic rather than structural and, unless you are keen to try it, is probably best avoided.

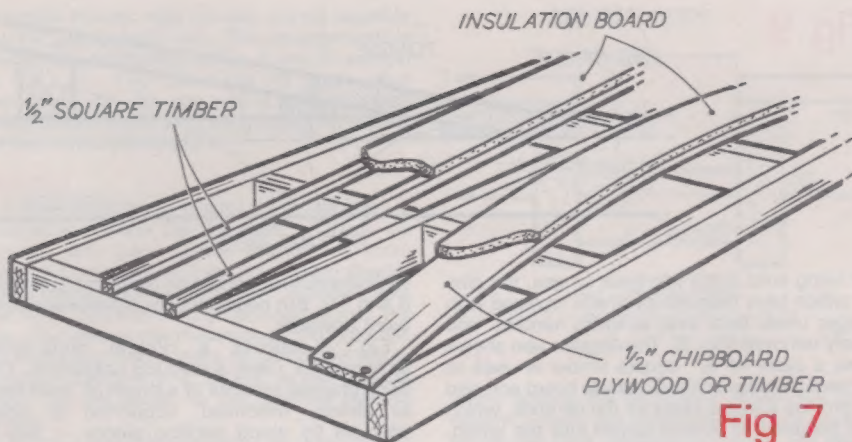
TOP SURFACES

We have found from long experience that the best material for the baseboard top is a hard grade insulation board — one well-known make is called 'Sundeala' It is light, strong, and readily takes (and retains) track pins and spikes, and

Fig 6



Joining baseboard sections together is not a problem using coach bolts or brass hinges as shown here.



can be cut with a sharp Stanley knife and a straight edge. It can also be sawn very satisfactorily, although this makes more mess than cutting. 'Sundeala' is available in $\frac{3}{8}$ " (9mm) sheets, 8' x 4'. It should be lightly pinned to the frame, rather than screwed.

There are other materials which can be used as a baseboard top. Hardboard is so hard that pilot holes need to be drilled for pins and even small screws. It also buckles and 'drums'. Plywood is very expensive and (especially in its modern waterproof forms) is equally hard. Chipboard again is expensive, and will not take pins or track spikes at all easily. Ordinary insulation board or soft board is light but not very strong, and although it will take pins, it will not 'hold' them very securely.

All in all, the wood fibre hard insulation board

is the best baseboard top we have found for general use.

JOINING BASEBOARD SECTIONS

There are two very easy methods of joining baseboard sections. The first is to pass $\frac{1}{4}$ " coach bolts through the frames, as shown in Fig. 6. The holes should be drilled through both frames clamped together *before* the top surface is laid; a wooden dowel in each section, locating in a hole in its partner, will help to locate the sections accurately. This method of joining is very suitable for layouts which are dismantled and moved only infrequently — perhaps a club layout which goes to an exhibition once or twice a year.

On truly portable layouts, a faster joining method is required. This can easily be provided

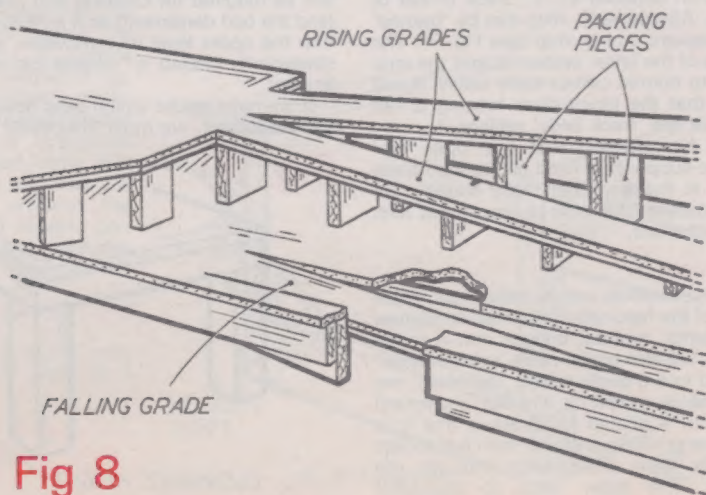
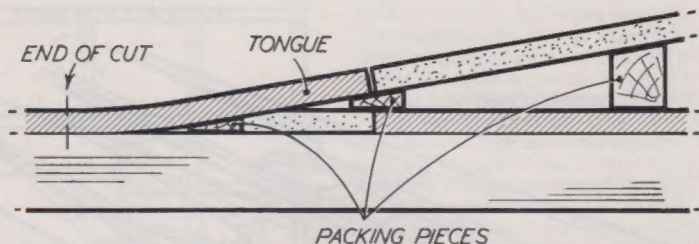


Fig 9



by using solid brass flap-back hinges, the pins of which have been removed and replaced with longer ones, bent over to form 'handles' and easily removed (Fig. 6). The diagram also shows how a piece of $\frac{1}{2}$ " square timber is used to protect the edge of the Sundeala board and also to provide a sound fixing for the rail ends, which are soldered to screws driven into the wood.

Most bumps or irregularities in track occur at baseboard joints. For some reason, they invariably stand proud. If they can be persuaded to be slightly hollow, the track can be packed up to make it level.

'OPEN TOP'

One of the disadvantages of the 'solid top' baseboard as described is that there can be no scenic effects *below* track level, an unsatisfactory state of affairs as a real railway is constantly changing from embankment to cutting and vice versa. The 'open top' baseboard solves this problem, and is only a little more complex to make. Here we use surfacing only where tracks are to be laid, usually called 'track bed' or 'road bed'. As the narrow strips of insulation board (approx. 2" wide per track for OO, 1 $\frac{1}{2}$ " for N) will not support themselves over 12" gaps, they must be laid on an underlay of $\frac{1}{2}$ " thick timber or chipboard. Alternatively, they can be 'framed' with $\frac{1}{2}$ " square timber strip (see Fig. 7). The advantage of the latter system is that the strip will bend to normal curves fairly easily. It will be noted that the longitudinal bracing is not required, as the 'track beds' replace it.

It must be admitted that the 'open top' system pre-supposes a fixed and settled track plan, and is therefore not really suitable for young modellers who wish to experiment with different schemes.

MULTI-LEVEL

Single level layouts can be rather dull. After all, much of the fascination of a railway derives from gradients, tunnels, bridges etc. A multi-level layout will also enable more 'route-mileage' to be fitted into a given space. Therefore, we must introduce gradients into our baseboard construction. It should be stressed that it is much easier to work upwards from baseboard level rather than downwards through the baseboard. The latter leads to structural

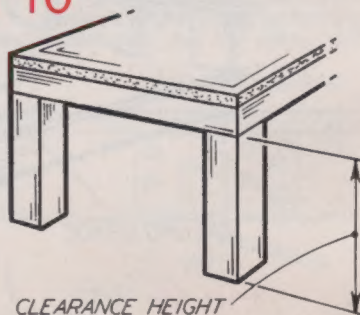
complications which *can* be overcome (see Figs. 8 and 11). But beginners are recommended to work upwards.

Fig. 8 shows a typical multi-level arrangement, using a solid top baseboard. The rising gradient consists of a length of 'track bed' as already described, supported at close intervals by wood packing pieces — this is where offcuts from building the main frame can come in so handy. Beginners are sometimes baffled as to 'starting a gradient' but actually it is very easy. Fig. 9 shows how a 'tongue' of insulation board is cut from the top surface, and is packed up to the required grade. The start of the slope should be as gradual as possible, as should the 'summit'.

At high-level stations, yards etc, the tracks are carried on a miniature version of the main baseboard, although a much lighter form of framing can be used, eg. $\frac{1}{2}$ " or 1" square timber, depending on area. Clearance must be provided for tracks running underneath the high level (approx. 3" for OO, 2" for N etc.). The low-level tracks must be laid first, and supports for the high-level baseboard positioned around them, making due allowances for clearance — remembering the overhang of bogie vehicles on sharp curves etc. Access to the lower tracks will be required for cleaning and maintenance (and the odd derailment) so it is highly desirable that the upper level be removable, and a few strategically-located $\frac{1}{4}$ " dowels can provide the answer.

If we have tracks which pass down through the baseboard, we must effectively build two

Fig 10



separate frames, side by side, joined together by the falling track bed. This arrangement is shown in perspective in Fig. 8 and in section in Fig. 11. You have got to enjoy your woodwork for this one and it may be much easier to take your falling track down the *outside* of the main baseboard.

BRIDGES

Where one track passes over another, a proprietary bridge can be used — there are several very good girder bridges, or more traditional masonry arches, available in plastic, either ready made or in kit form. In either case, the track bed can simply continue across the gap. Sometimes the thickness of the base can be excessive, and a deck of hardboard forms a better solution. If it 'drums' under passing trains, all the better for the ultimate realistic effect.

Where a bridge is introduced for purely scenic effect, across a model river or valley, it is usually

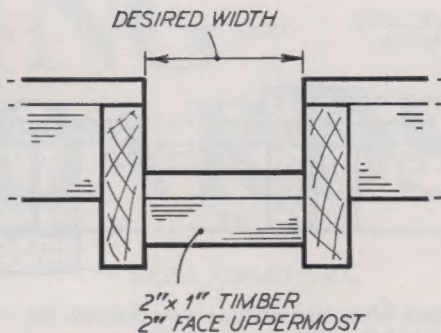


Fig 11

room, access will be needed where the door occurs, unless you are happy to 'duck under', which can be a hardship for some. The lifting section is really nothing more than a 'counter

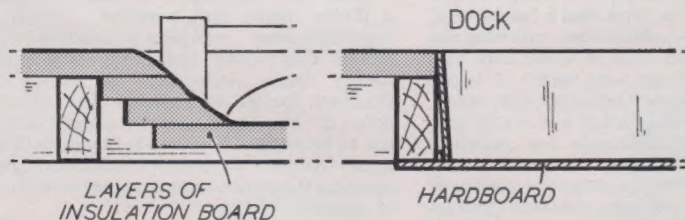


Fig 12

possible to cut away a section of baseboard to accommodate the river or sunken road. Docks, wharves etc. can very easily utilise the 2" deep baseboard members as the 'walls', with hardboard pinned to the underside of the frame representing the surface of the water (Fig. 12).

Where a deeper 'valley' is required, the relevant portion of the baseboard must be 'dropped'. A simple method is shown in Fig. 13, using either wooden webs or gussets or metal brackets to strengthen the dropped frame. It is inevitable that this will tend to weaken the baseboard locally, particularly with portable layouts.

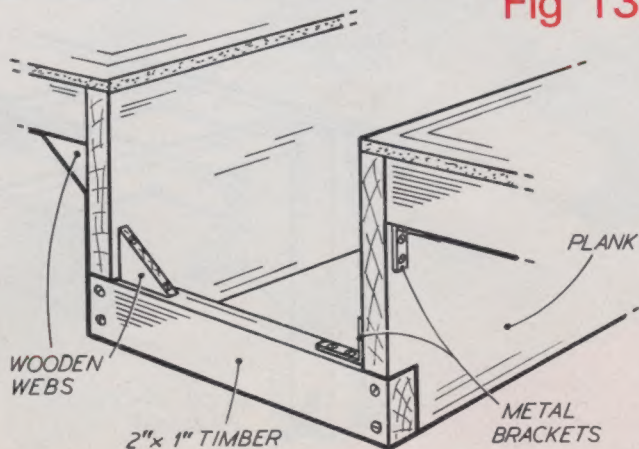
FLAPS AND LIFTING SECTIONS

When a layout runs around the walls of a

Method of 'dropping' the baseboard to accommodate scenic valleys etc.

flap', usually about 3' long, hinged at one end and supported by a ledge at the other (Fig. 14). It is important to note that the hinges must be packed up at least above track level, so that the rail ends 'pull away' from each other slightly when the flap is opened. Electrical protection for trains which may otherwise plunge into the

Fig 13



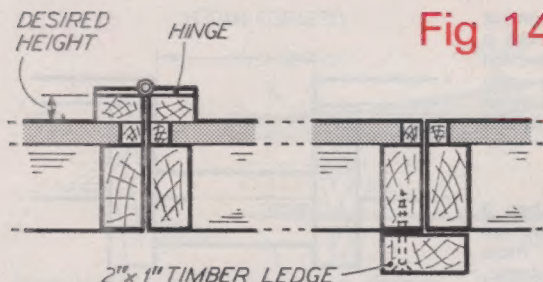


Fig 14

abyss left by an open flap is very desirable, but beyond the scope of this booklet.

SUPPORTS

When building a permanent model railway, the height the baseboard will be above the ground is a choice which has to be made early. It is really very much a matter of personal preference. Models usually look more realistic viewed at a scale eye level, and a height of 4' to 4'6" can be very satisfactory, provided the baseboard is not too wide. A width over 18" really demands a baseboard height of about 3'6", which keeps everything within easy reach. Also, if the railway is a 'Father and young son' project, then high baseboards are obviously ruled out.

Baseboards can be supported in a variety of different ways. Old cabinets, chests-of-drawers etc. can often be pressed into service if appearance is not important, and the storage space is useful although under-baseboard access is virtually impossible. If portable baseboards are supported on decent furniture, incidentally, it is essential to fit rubber pads or bumpers under the framing, to minimise the possibilities of scratching or other damage.

Fig. 15 shows a simple but robust form of permanent baseboard construction, where the

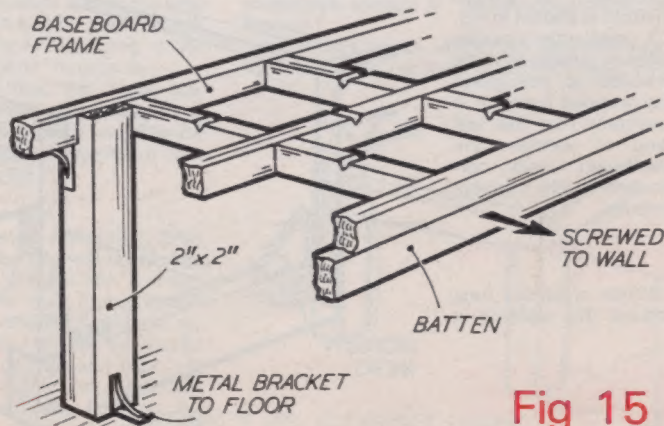
rear edge rests on a continuous batten plugged and screwed to the wall. The uprights are 2" x 2" (50mm x 50mm) timbers, 'halved' to fit the baseboard frame and strengthened with metal shelf brackets. We recommend that the uprights be not less than 4' apart — perhaps closer in areas near to the control panels, where people are bound to lean on the edge.

The baseboard edge in its 'raw' state — ie., the edge of a piece of insulation board on top of unpainted timber — is not exactly elegant, and a nice finishing touch is to use hardboard 'profile boards', cut to follow the contours of the hills etc. Matt black or grey is a good colour for these, as nothing should be used which might detract the eye from the model railway and its scenery.

Under the baseboard is also not usually a pretty sight, and curtains — hung on expanding wire — can hide a multitude of sins, though they collect dust. Framed hardboard panels, made removable for access, are excellent, though they should ideally be inset about 6" from the baseboard edge if they are not to be kicked. Shelving is obviously a very useful way of filling under-baseboard space, although this is not easily compatible with ease of access.

PORTABLE LAYOUTS

Small portable layouts, of the sort commonly seen at exhibitions, should stand about 3' high, or instability may become a problem. Simple trestles will often suffice for support, or each baseboard may be fitted integrally with its own folding legs, hinged to the framework. Inspection of a trestle table will amply explain the 'technology' involved!



A permanent baseboard can be screwed to a wall batten along the rear, with supporting legs along the front edge only.

Fig 15